

Amendments to the Specification

Please delete the title and replace it with the following new title:

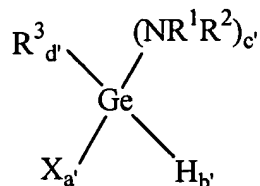
--METHOD OF DEPOSITING GERMANIUM-CONTAINING FILMS--

After the title, please insert the following new paragraph describing related applications.

--This application claims the benefit of provisional application serial number 60/460,791, filed on April 5, 2003, and provisional application serial number 60/513,475, filed on October 22, 2003, and provisional application serial number 60/513,476, filed on October 22, 2003.--

Please delete the paragraphs beginning with "The present inventors have surprisingly found . . ." starting at page 3, line 4 and ending with ". . . X = Cl." at page 5, line 11, and replace them with the following new paragraphs.

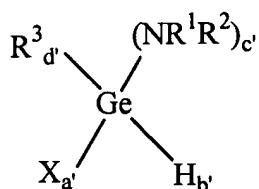
--The present inventors have surprisingly found that the above limitations on the deposition of germanium by CVD can be remedied. The present invention provides a method of depositing a film containing germanium on a substrate including the steps of: a) conveying two or more germanium compounds in a gaseous phase to a deposition chamber containing the substrate, wherein a first germanium compound is a halogermanium compound of the formula $X^{1}_{4-a}GeR_a$, wherein $a = 0-3$, each X^1 is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and NR^3R^4 , ~~wherein each R^3 and R^4 is~~ NR^4R^6 , wherein each R^4 and R^6 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and wherein a second germanium compound has the formula



wherein each R^1 and R^2 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each R^3 is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen; $a' = 0-4$; $b' = 0-4$; $c' = 0-3$; $d' = 0-4$ and $a' + b' + c' + d' = 4$; provided that $a' + b' \leq 3$ when $X^1 = Cl$, $R = H$, and

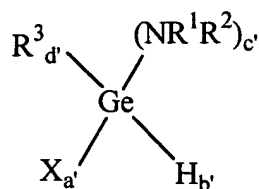
X = Cl; b) decomposing the two or more germanium compounds in the deposition chamber; and
c) depositing the film comprising germanium on the substrate.

Further, the present invention provides a method of manufacturing an electronic device including the step of depositing a film containing germanium on a substrate wherein the film including the steps of: a) conveying two or more germanium compounds in a gaseous phase to a deposition chamber containing the substrate, wherein a first germanium compound is a halogermanium compound of the formula $X^1_{4-a}GeR_a$, wherein $a = 0-3$, each X^1 is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and NR^3R^4 ; ~~wherein each R^3 and R^4 - NR^4R^6 , wherein each R^4 and R^6 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and wherein a second germanium compound has the formula~~



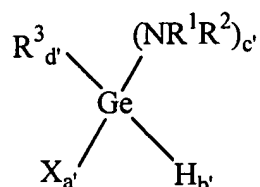
wherein each R^1 and R^2 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each R^3 is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen; $a' = 0-4$; $b' = 0-4$; $c' = 0-3$; $d' = 0-4$ and $a' + b' + c' + d' = 4$; provided that $a' + b' \leq 3$ when $X^1 = Cl$, $R = H$, and $X = Cl$; b) decomposing the two or more germanium compounds in the deposition chamber; and
c) depositing the film comprising germanium on the substrate.

The present invention also provides a composition including two or more germanium compounds; wherein a first germanium compound is a halogermanium compound of the formula $X^1_{4-a}GeR_a$, wherein $a = 0-3$, each X^1 is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and NR^3R^4 ; ~~wherein each R^3 and R^4 - NR^4R^6 , wherein each R^4 and R^6 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and wherein a second germanium compound has the formula~~



wherein each R^1 and R^2 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each R^3 is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen; $a' = 0-4$; $b' = 0-4$; $c' = 0-3$; $d' = 0-4$ and $a' + b' + c' + d' = 4$; provided that $a' + b' \leq 3$ when $X^1 = Cl$, $R = H$, and $X = Cl$.

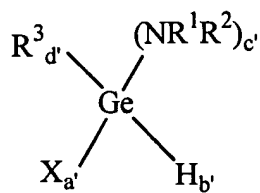
Still further, the present invention provides a vapor delivery device suitable for feeding a fluid stream saturated with a germanium compound suitable for depositing a film containing germanium to a chemical vapor deposition system including a vessel having an elongated cylindrical shaped portion having an inner surface having a cross-section, a top closure portion and a bottom closure portion, the top closure portion having an inlet opening for the introduction of a carrier gas and an outlet opening, the elongated cylindrical shaped portion having a chamber containing two or more germanium compounds; the inlet opening being in fluid communication with the chamber and the chamber being in fluid communication with the outlet opening. In one embodiment, the two or more germanium compounds include a first halogermanium compound of the formula $X^1_{4-a}GeR_a$, wherein $a = 0-3$, each X^1 is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and NR^3R^4 , ~~wherein each R^3 and R^4~~ NR^4R^6 , wherein each R^4 and R^6 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and a second germanium compound of the formula



wherein each R^1 and R^2 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each R^3 is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen; $a' = 0-4$; $b' = 0-4$; $c' = 0-3$; $d' = 0-4$ and $a' + b' + c' + d' = 4$; provided that $a' + b' \leq 3$ when $X^1 = Cl$, $R = H$, and $X = Cl$.--

Please delete the paragraph beginning with "The present invention provides . . ." at page 6, line 4, and replace it with the following new paragraph.

-- The present invention provides a method of depositing a film containing germanium on a substrate including the steps of: a) conveying two or more germanium compounds in a gaseous phase to a deposition chamber containing the substrate, wherein a first germanium compound is a halogermanium compound of the formula $X^1_{4-a}GeR_a$, wherein $a = 0-3$, each X^1 is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and NR^3R^4 ; ~~wherein each R^3 and R^4 - NR^4R^6 , wherein each R^4 and R^6 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and wherein a second germanium compound has the formula~~



wherein each R^1 and R^2 are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each R^3 is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen; $a' = 0-4$; $b' = 0-4$; $c' = 0-3$; $d' = 0-4$ and $a' + b' + c' + d' = 4$; provided that $a' + b' \leq 3$ when $X^1 = Cl$, $R = H$, and $X = Cl$; b) decomposing the two or more germanium compounds in the deposition chamber; and c) depositing the film comprising germanium on the substrate. In one embodiment, the second germanium compound is an alkyl germane. Exemplary alkyl germanes include, without limitation, those compounds having the above formula where $a'=c'=0$, $d' = 2-3$, and $b' = 1-2$. In a further embodiment, the alkyl germanium compound is a heteroleptic alkyl germanium compound. By “heteroleptic alkyl germanium compound” is meant a germanium compound having mixed alkyl groups, i.e., a germanium compound having two or more alkyl groups where at least two of the alkyl groups are different. Exemplary heteroleptic alkyl germanium compounds include those of the formula $R^5_zGeH_y$, wherein each R^5 is independently chosen from alkyl, alkenyl, alkynyl and aryl; $z = 2-3$; and $y = 1-2$.--

Please delete the paragraph beginning with “Any of the above alkyl, . . .” at page 7, line 26, and replace it with the following new paragraph.

--Any of the above alkyl, alkenyl, alkynyl or aryl groups of R, R^1 and R^2 may optionally be substituted with one or more amino (~~NR^3R^4~~) (NR^4R^6) groups, wherein ~~R^3 and R^4~~ R^4 and R^6

are independently chosen from H, alkyl, alkenyl, alkynyl and aryl. By “substituted” it is meant that one or more hydrogens on the alkyl, alkenyl, alkynyl or aryl group is replaced with one or more NR^3R^4 - NR^4R^6 groups. Exemplary alkyl substituted with NR^3R^4 - NR^4R^6 groups include, without limitation, dimethylamino-methyl $((\text{CH}_3)_2\text{N}-\text{CH}_2-)$, dimethylamino-ethyl $((\text{CH}_3)_2\text{N}-\text{C}_2\text{H}_4-)$, diethylamino-ethyl $((\text{C}_2\text{H}_5)_2\text{N}-\text{C}_2\text{H}_4-)$, dimethylamino-propyl $((\text{CH}_3)_2\text{N}-\text{C}_3\text{H}_6-)$, and diethylamino-propyl $((\text{C}_2\text{H}_5)_2\text{N}-\text{C}_3\text{H}_6-)$.--